Water Resources Assessments and Research Subactivity

Program	FY 2000 Estimate	Uncontrol. & Related Changes	Program Changes	FY 2001 Budget Request	Change from FY 2000
Ground-Water Resources	2,800	+87	0	2,887	+87
National Water-Quality Assessment	**61,883**	**+1,263**	**0**	**63,146**	**+1,263**
Toxic Substances Hydrology	13,306	+331	-1,240	12,397	-909
Hydrologic Research & Development	13,048	+331	-1,454	11,925	-1,123
Total Requirements $000	91,037	+2,012	-2,694	90,355	-682

National Water-Quality Assessment Program

Current Program Highlights

The USGS National Water-Quality Assessment (NAWQA) Program continues to address long-term goals:

- Describe the status and trends in the quality of a large, representative part of the Nation's surface water and ground water resources;
- Provide an improved understanding of the primary natural factors and human activities affecting these conditions; and
- Provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other Federal, State, and local agencies.

The USGS approaches these goals using four major program elements:

- Study unit investigations of major river basins and aquifer systems -- Study unit investigations follow consistent practices from data collection through interpretation, to facilitate comparability of findings over time and across the Nation.

- National syntheses of key findings related to important water-quality topics from investigations in the study units and from other water-quality investigations -- National synthesis projects compare findings across the country and identify relationships between land use, geology, soils, climate, and water-quality conditions. The current national synthesis topics are pesticides, nutrients, volatile organic compounds, trace elements, and aquatic ecology.

- Supporting research and methods development -- To ensure NAWQA data collection and analyses are relevant to emerging issues, about 10 percent of program resources are devoted to developing new methods of sample collection and analysis, and to continuously improving assessment techniques.

- Coordination with others at local, State, regional, and national levels with environmental and natural resources managers and other users of water-quality information -- Nationally, over the past year NAWQA coordination has increased significantly with both the USEPA and the National Park Service. NAWQA has provided direct service to the USEPA Office of Pesticide Programs, assisting in the timely and relevant application of NAWQA data to that Office's decision-making process. This association has made millions of dollars of field pesticide data available in a useful form for USEPA decision-making.

NAWQA has been designed as an efficient program, taking advantage of other USGS programs and the existing USGS infrastructure. Despite these efficiencies, over the past 9 years, inflation has had an impact on the Program. Instead of operating all 59 of the planned study units by 1998, the USGS had only begun work in 49. In 1998, the USGS began a study that focuses on the High Plains aquifer--an area of the country encompassing 7 study units where work had been postponed. Also, in 1999 data collection began for the second time in two of the original NAWQA pilot study units (Delmarva Peninsula and the Yakima River Basin). Although adding these two new study units was important, even with their addition, program activities still do not meet the planned operational level of about 20 study units per cycle. Also, decreased activity in other programs supporting NAWQA, resulting from uncontrollable costs and budget decreases, have required the NAWQA Program to redirect resources to ensure that crucial supporting activities are maintained. As a result, NAWQA must continually adjust program resources, and beginning in FY 2000 , the number of study units the program continues to operate must be evaluated annually.

The NAWQA Program is nearing the completion of Cycle I studies that began in 1991 and focused on the occurrence and distribution of contaminants. Cycle II studies will begin in 2001 and will focus on explaining the environmental conditions that influenced the distribution of contaminants.

As the NAWQA Program moves into Cycle II, studies will be underway in 42 study units (see Figure W-1). A science panel spent several months selecting the Cycle II study units. Drinking water use, diverse hydrologic settings, contaminant source areas, important aquifers, and biological diversity were considered in selecting the Cycle II study units. Those study units will compare previous findings with new findings to further enhance the understanding of water quality conditions in those areas and the factors affecting those conditions. The Cycle II study units are distributed throughout the Nation and will provide substantive information for all regions to assess the quality of water resources. That assessment will significantly supplement the knowledge base of local, State, and regional water providers and users. Additionally, the USGS will provide industrial and agricultural users with a database to address their interests in water quality.

Program Coordination

At the study unit level and nationally, NAWQA Program personnel continue to meet with environmental and resource managers, and other water information users at all levels of government. Through liaison committees at the national and study unit level, nearly 1,500 individuals represent their agencies or constituents in discussions on the program's progress, data, and products. These interactions have provided public and private sector groups with protocols for designing sampling and monitoring programs, with guidance in use of data for decision-making, and with opportunities for cost-sharing in water-quality investigations.

The USGS has established a NAWQA Home Page on the World Wide Web (http://wwwrvares.er.usgs.gov/nawqa/nawqa_home.html) to provide rapid access to NAWQA data, reports, and methods documents. Also available is an

up-to-date listing of current developments that allows interested parties to get new information in a timely fashion.

To share program knowledge, NAWQA managers have developed an aggressive program of coordination with Federal agencies such as the USEPA, State and local agencies, and the private sector. For example, NAWQA staff have been assigned office space in selected USEPA offices to ensure that technical information and resources are shared, so that duplication can be avoided and Federal dollars can be saved. Numerous liaison meetings are held each year by each active NAWQA study unit, informing interested parties from the public and private sectors of program findings and plans. Input from these same groups is sought and incorporated in program activities. For example, these groups influence the selection of sampling sites and the selection of chemicals analyzed, and assist USGS in gaining access to sampling locations.

To ensure relevance and objectivity, the NAWQA Program will support an outside review by the National Academy of Science (NAS) that will be completed in 2001. The NAS committee will consider selected topics for an in-depth review and will provide findings and recommendations. The NAS review will be used to plan, direct, and reinforce program activities. The review follows an in-depth internal USGS review of the NAWQA Program that provided the template for Cycle II.

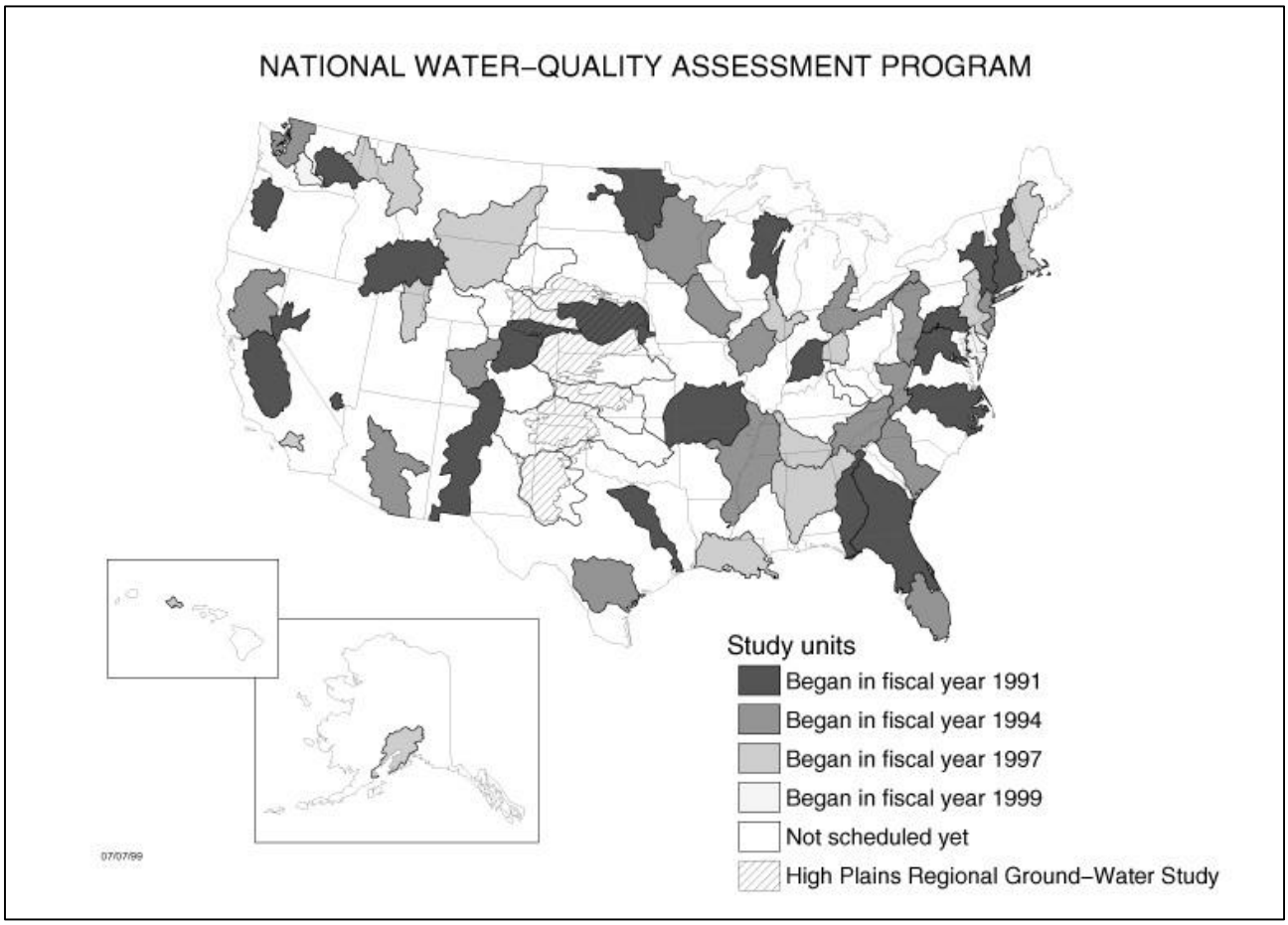

Figure W-1

Recent Accomplishments

Monitoring Networks -- Regional and local-scale ground-water sampling results from the NAWQA project on the Delmarva Peninsula have been incorporated into the Delaware Department of Natural Resources and Environmental Control Geographic Information System. These data are being used in the design of a sampling network to study contamination of ground water used by small community water systems throughout Delaware.

Volatile Organic Compounds -- The USEPA is concerned about impacts to water resources and drinking water from the gasoline oxygenate methyl tert-butyl ether (MTBE). Knowledge from NAWQA's broad-scale monitoring of ground water and compilation of MTBE drinking-water analyses has provided key information to the USEPA's Blue Ribbon Panel on Gasoline Oxygenates. Field testimony to the Blue Ribbon Panel on key NAWQA findings was given by the USGS in January and April 1999 and this testimony was partly responsible for the panel's recommendation that the use of MTBE in gasoline be significantly reduced to minimize additional degradation of water quality.

Environmental Management -- A surprising number of MTBE detections in ground water from monitoring wells installed in eastern Iowa urban land-use studies resulted in State legislation that limits the amount of MTBE in motor vehicle fuels to less than two percent by volume and requires that samples for the analysis of MTBE in water and soil be included as part of monitoring at leaking underground storage tanks sites.

Database Enhancements

To meet program synthesis goals it is critical to have a user-friendly database where chemical, biological, ancillary site/basin characteristics, and quality-control data are all linked. The database development team is staffed with USGS experts from throughout the Nation and consultants from the private sector. The team is using state-of-the-art software. By using commercially available software, development time and cost is reduced and the functionality is enhanced. Considerable success has been attained, and after less than a year a useful product is already in use. When this effort is complete, the USGS will have an easily accessible, comprehensive, and functional hydrologic database populated from diverse locations across the Nation. This will be of great benefit to NAWQA staff as well as all parties interested in these data.

Pesticides -- A study of pesticides in urban streams published jointly by NAWQA, the Washington State Department of Ecology, and King County, Washington, has caused State and local managers concern. Study results, showing levels of some insecticides in urban streams at concentrations violating criteria for the protection of aquatic life, have played a part in decisions by these managers to implement procedures to reduce the use of pesticides on public lands. Additional work in the area of pesticides involves two new methods developed at the USGS National Water Quality Laboratory for analyzing low levels of pesticides (herbicides and insecticides) and their degradation products in water samples. In combination with another method developed by NAWQA scientists, these two new methods will provide nearly complete coverage of the top 100 agricultural pesticides of national importance and will account for more than 90 percent (by weight) of pesticides applied each year.

Drinking-Water Studies -- The USEPA is revising national primary drinking water regulation for arsenic. NAWQA has provided USEPA's Office of Ground Water and Drinking Water with estimates of the arsenic concentrations in ground waters used as source waters by public purveyors across the U.S. This information allows estimation of the changes in treatment costs

associated with adoption of standards at differing arsenic levels. Also, the National Cancer Institute has incorporated NAWQA results from a review of arsenic in bedrock public supply wells into regional studies of cancer rates in the U.S. Arsenic is a known carcinogen. Information on both the sources of drinking waters and geologic and hydrologic variables that may relate to cancer mortality will also be included in the study.

Environmental Management -- The Edwards Aquifer Authority, charged with managing and protecting the Edwards aquifer in south-central Texas, will begin assessing water-quality conditions and long-term trends in an urbanized part of the Edwards aquifer recharge zone on the basis of data collected from 30 monitoring wells installed cooperatively with the NAWQA program.

Tribal Assistance -- After exposure to NAWQA field sampling protocols for surface water and ground water, the Gila River Indian Community's Department of Environmental Quality has been training staff and using these state-of-the-art protocols for their water-quality sampling programs.

Environmental Monitoring -- The Missouri Department of Natural Resources and the Missouri Department of Conservation have signed an MOU agreeing to enter into a joint statewide aquatic resource-monitoring program that will assess fish, invertebrates, and habitat at 100 stream sites in Missouri. The NAWQA fish, invertebrate, and habitat methods protocols are being used for the development of their sampling protocols.